Differentiation of Trigonometric Functions Homework Name _____

Find the derivative of the function.

1. $y = \cos 4x$

2. $y = \sin 2x - \cos 3x$

3. $y = x \sin x$

4. $y = \cos^3(x^2)$

5. $y = \sqrt{\sin x + 3}$

6. $y = x^4 \sin^2 x$

7. $y = \tan(3x)$

8. $y = \cot^2 x$

9. $y = \tan\sqrt{2x - 3}$

10. $y = \sin^2 x + \cos^2 x$

11. $y = \sin(\cos x)$

12. $y = \sec(\pi x)$

13. $y = \frac{1}{2}\sin^4 2\theta$

14. $y = \sin(x - 5)^2$

15. $y = \frac{\sin x}{1+\cos x}$

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Find the equation of the tangent line at the given point.

16. $y = \sin 2x$ at $(\pi, 0)$

17. $y = \tan^2 x$ at $\left(\frac{\pi}{4}, 1\right)$

18. $y = \cos 2x$ at $x = \frac{\pi}{4}$

19. $y = \cos x^2$ at $x = 0$

Find the second derivative of the function.

20. $f(x) = \sin x^2$

21. $g(x) = \sin^2 x$

22. Find the point(s) at which the graph of $f(x) = \sin 2x + 2\cos x$ has a horizontal tangent line on the interval $(0, 2\pi)$.

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